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XVI.—*On a new Lizard, with Ophidian affinities, from the Lower Chalk* (Saurospondylus dissimilis). By Harry Seeley, F.G.S., of the Woodwardian Museum, Cambridge.

Professor Owen described the *Raphiosaurus subulidens* from the Lower Chalk of Cherry Hinton, and I should perhaps have been inclined to refer the vertebra here described from that locality to the same genus, had not a sight of Mr. Carter's type specimen shaken my faith in its reptilian character. So far as external features go, there is nothing to suggest that it is not the jaw of a fish. Even were it reptilian, it is so disproportionately large in comparison with this vertebra, that the identity of the two would still be doubtful. But Professor Owen appears to know the vertebræ of *Raphiosaurus*; for, in the 'Palæontology' (p. 311, 2nd ed.), it is on such evidence that the species is said to be based.

The Lizards yet known from the Chalk have procœlian vertebræ with that simple structure of the zygapophyses in which the front articulations are turned up and exposed, and the back pair turned down. This structure, characteristic of most vertebræ, would appear to result from the fact that the limbs support that part of the skeleton which is in front of them—a function manifest in the straight or upward tendency of the neck, where each vertebra rests on its zygapophyses, and the downward direction of the tail, where the vertebræ hang without support under the zygapophyses.

The development and origin of these processes and the form of the bones depend on the functions of the muscles, though in a less degree than in the limbs, where bones appear to have owed their very existence to muscular and functional action.

But in *Saurospondylus* the vertebra has ten articular facets, as in Serpents and in the Iguana Lizards, in which the neurapophyses

overhang and lock on to the zygapophyses of the vertebra in front. Such a structure indicates a flexible vertebral column, for it allows of dorsal vertebræ being supported by the anterior limbs. In the lumbar region of many mammals, such as the Armadillo, the Raccoon, and even the wild Cat, where there is much upward and downward motion, there is a near approach to a like modification of yoking.

This vertebra, with depressed centrum, obliquely overhanging and transversely oval cup and ball, zygosphene, and zygantrum, indicates the lower dorsal region of a small reptile having its nearest affinities with *Iguana*. It is $\frac{3}{8}$ths of an inch long, not quite so wide in front where widest. It was found in the lower Chalk of Cherry Hinton, near Cambridge.

There is no neural spine, and no hypapophysis.

The inferior surface of the centrum is subtriangular. The length from the base of the cup in front to the base of the ball behind is equal to the width of the zygapophyses in front. From these, two strong curved ridges descend and approximate to the bottom of the sides of the ball. The subtriangular area so enclosed is a little convex transversely and concave in length.

The vertebra is $\frac{3}{10}$ths of an inch high in front, nearly one-half being the height of the centrum, and the remainder that of the neural arch, which is higher behind than in front, and may there have had a slight neural spine. The neural arch on each side is a smooth cupped surface, with a concave border, and contracts behind.

The anterior zygapophyses are horizontal square surfaces, hardly above the border of the cup, from which they are separated in front by a perpendicular concavo-convex surface on each side, about the size of their own articulations.

The zygosphene projects in front of the vertebra, and is just as wide as the cup. Its superior front margin is concave and horizontal. Its flat articular surfaces, which look forward and outward, are very narrow, and entirely between the zygapophyses, above and in front of which they project about half their own length.

The neural arch is very thin in front, thicker behind, where the processes are less perfectly preserved.

The sides of the vertebra are narrow, concave, wedge-shaped surfaces bordered by (1) the basal ridges already mentioned, and (2) the concave ridges at the sides, which from above make the outline of the neural arch, are laterally parallel with its top ridge, and connect the anterior with the posterior zygapophyses. Both ridges meet in front, below the zygapophyses in the tubercle for the rib, which is broken off on both sides.

The body of the centrum and the neurapophyses appear to be

cellular. The outline of the posterior end of the vertebra is pentangular, as high as wide. The height of the ball appears to be less than the depth of the cup.

Of the vertebral differences of Serpents and Lizards little is known. This fossil resembles a serpent more than could have been expected, and yet in other modifications comes near to the Lizards. A Cretaceous serpent may have been more Lacertian than any now known, and a lizard of the Chalk may have been more Ophidian.

The chief Lacertian features which I detect are—

(1.) The absence of an hypapophysis, which all serpents appear to have, though in some (as in *Python*) it is very slight.

(2.) The depressed centrum, with transversely oval and overhanging cup and oblique ball, are Lizard characters, though the cup is oblique in *Crotalus*, *Paleryx depressus*, &c., and the ball is transversely elliptical in some other forms.

(3.) The absence of additional diapophyses besides the costal tubercle is characteristic, though they are not found in all Ophidia.

(4.) The neural arch is not notched between the zygantra, as in Serpents, but is prolonged back a little between and over them, as in *Iguana*. The zygantra are excavated in the middle of the sides of the neural canal, as in *Iguana*, and not at its summit, as in most serpents, though *Naja*, *Hydrus*, *Natrix*, &c., are exceptions.

(5.) The zygosphene projects well over the cup, as in *Iguana*, and is not level with it, as in Ophidians.

(6.) *Iguana* has similar basal ridges, and depressions under the costal tubercle, like those in the fossil, only more developed. But neither in lizards nor in serpents does the basal ridge meet the ridge between the zygapophyses, because the costal tubercle is always lower down.

The more marked Ophidian characters are—

(1.) The broad quadrate form, which is nearer to *Palæophis* than to *Iguana*, though the anterior vertebræ of this and most lizards are as short. In *Scincus* there is much the same general form of the vertebra, and a like absence of neural spine and hypapophyses; but the zygosphene can hardly be said to exist, the zygapophyses are never horizontal, and are well raised above the tubercle for the ribs.

(2.) The horizontal zygapophyses, level with the top of the cup, find their parallel in *Eryx* and most Serpents; but in *Iguana*, the nearest to it of the Lizards, they are higher. *Iguana* wants the sharp ridge connecting the zygapophyses; it is characteristic of some serpents, but is also found in *Scincus*.

The balance of evidence from the few data at my command

rather inclines to the conclusion that *Saurospondylus* was an Iguanoid Lizard, hardly separable from the Serpents, than that it indicates a Cretaceous Ophidian. So classed, it is the type of a new family.

XVII.—*Notice of a new Finner Whale from Formosa.*

By Dr. J. E. Gray, F.R.S. &c.

Mr. Swinhoe has kindly sent me some bones of a Finner Whale which was cast ashore on the coast of Formosa.

The cervical vertebræ show that it is quite distinct from any Whale the bones of which have previously come under my examination.

It agrees with the smaller Finner, *Balænoptera rostrata* of Europe, in the second and third cervical vertebræ being united, while in all the other true Finners known they are free; and also in the subcircular form of the front part of the neural canal.

I am therefore inclined to refer it provisionally to the genus *Balænoptera* as restricted in my paper (Proc. Zool. Soc. May 24, 1864); but I think it probable that, when we know the entire number of the vertebræ and other details of the skeleton, it will prove to be a distinct form.

The Whale may be named *Balænoptera Swinhoei*.

The second cervical vertebra with large, broad, truncated, lateral processes, with a large, oblong, subcentral perforation; the lateral processes are each two-thirds of the transverse diameter of the articulating surface of the body of the vertebra.

The third cervical united to the second by the anchylosis of the neural arches; the body thin, oblong, transverse, broader than high; the lateral processes slender, truncated at the end, not so long as the transverse diameter of the body, curved towards each other at the end, but not forming a ring.

The rest of the cervical vertebræ free.

The sixth or seventh cervical with a thin body, and a slender, nearly straight upper lateral process, and only a very short tubercle on each side below.

The neural cavity of the second cervical vertebra subcircular, rather less high than broad, and not quite so wide as half the diameter of the front side of the body.

The neural cavity of the third cervical vertebra oblong, transverse, rounded above, as wide as half the transverse diameter of the body, and about one-third broader than high.

The bones are nearly the same size as the similar bones in the *Physalus antiquorum*, which is between 60 and 70 feet long when alive; they therefore belong to an animal at least three times as large as the *Balænoptera rostrata* of Europe.